



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/563,462	01/05/2006	Teruo Ishishita	10517/312	1346
23838	7590	11/16/2007		
KENYON & KENYON LLP 1500 K STREET N.W. SUITE 700 WASHINGTON, DC 20005			EXAMINER RAMADAN, RAMY O	
			ART UNIT 2838	PAPER NUMBER
			MAIL DATE 11/16/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/563,462

Applicant(s)

ISHISHITA, TERUO

Examiner

Ramy Ramadan

Art Unit

2838

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 05 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 22-39 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 22-25, 30-33, 38 and 39 is/are rejected.
- 7) ☒ Claim(s) 26-29 and 34-37 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 January 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 01/05/2006.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Drawings*

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, a charge/discharge restriction device, a remaining capacity detection device, a control value computation device, a capacity difference computation device, a storage device, an apparent state-of-charge value computation device and an apparent state-of-charge value adoption device must be shown or the feature(s) canceled from the claim(s) (Claim 22). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner,

the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Objections***

2. Claims 22, 25, 27, 30 and 33 are objected to because of the following informalities:

The limitation such as "the predetermined capacity difference maximum value is adopted instead of the capacity difference" is indefinite, since it is not clear what the applicant means by the term "adopted" and it is not clear from the limitation in what way does the control apparatus adopts the predetermined capacity difference maximum value (Claims 25 and 33).

Claim 30 should be rewritten in a proper form to overcome the informalities of the spacing between words; a proper form would be as follows:

A battery pack charge/discharge control apparatus for controlling charge/discharge of a battery pack that is formed by combining a plurality of unit batteries of a secondary battery type, comprising:

remaining capacity detector that detects remaining capacities of unit batteries constituting the battery pack; and

controller that restricts the charge/discharge based on at least one of a capacity upper limit value and a capacity lower limit value of the unit batteries constituting the battery pack, computes a control state-of-charge value based on at least one of a minimum value and a maximum value of the detected remaining capacities, computes as a capacity difference, a remaining capacity difference between the remaining

capacity of a first unit battery and the remaining capacity of a second unit battery among the unit batteries whose remaining capacities have been detected, the remaining capacity of the second unit battery being less than the remaining capacity of the first unit battery, stores a correlation between the capacity difference and an apparent state-of-charge value that is different from the control state-of-charge value, computes an apparent state-of-charge value with reference to the correlation based on the capacity difference, and the controller adopts the apparent state-of-charge value if the capacity difference is at least a predetermined capacity difference that is stored beforehand.

The word "a" or "an" should precedes the terms "charge/discharge restriction device", "remaining capacity detection device", "control value computation device", "capacity difference computation device", "storage device", "apparent state-of-charge value computation device" and "apparent state-of-charge value adoption device" (Claim 22), "remaining capacity detector" and "controller" (Claim 30).

The Mathematical expression (2), " $Q_{high} Q_{low} Q_d (2)$ " should read as  $--Q_{high} Q_{low} - Q_d (2)--$  (Claims 27 and 35).

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. **Claims 22-29 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement.**

The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. A charge/discharge restriction device, a remaining capacity detection device, a control value computation device, a capacity difference computation device, a storage device, an apparent state-of-charge value computation device and an apparent state-of-charge value adoption device were not described in the specification, these devices are disclosed in claim 22 to be performing different functions, while the specification describes a single device (battery ECU (200)) performing the different functions.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. **Claims 22-25, 30-33 and 38-39 are rejected under 35 U.S.C. 102(b) as being anticipated by KIKUCHI et al. (EP 909001 A2), hereinafter Kikuchi.**

As per claims 22-23 and 30-31, Kikuchi discloses and shows in Fig. 7, a battery assembly charge and discharge control device for controlling the amount of charge and discharge of a battery assembly (50) that is formed by combining a plurality of battery blocks (74) (unit batteries) of a rechargeable (secondary) battery type (Page 8, Para [0053]), comprising:

a voltage sensor (76) (remaining capacity detector) that detects voltages corresponding to the state of charge or SOC (remaining capacities) of the battery blocks (Abstract and Page 8, Para [0053]); and

a battery ECU (68) (controller) that controls (restricts) the amount of charge and discharge based on a SOC upper limit value (80%) (a capacity upper limit value) and a SOC lower limit value (20%) (capacity lower limit value) of the battery blocks (74) (Page 4, Para [0028], Page 5, Para [0031] and Page 8, Para [0052]-[0053]), detects (computes) an integrated SOC or charged amount (RAHR) (a control state-of-charge value) based on a minimum value (1.3AH) of the detected charged amount as a reference value (Page 9, Para [0062]-[0065] and Fig. 9), computes as a movable range ( $\Delta$ AHR) (capacity difference), a charged amount (remaining capacity) difference between the charged amount of a first battery block (74) with the most charged amount (maximum remaining capacity) and the charged amount of a second battery block (74) with the least charged amount (Page 4, Para [0022], Page 6, Para [0044], Page 8, Para [0057]-[0058], Page 9, Para [0059] and Figs. 7 and 9), stores an expression (2) that represents a correlation between the movable range ( $\Delta$ AHR) and a new SOC (N-SOC) (an apparent state-of-charge value) that is different from (RAHR) value, computes the new SOC (N-SOC) with reference to the expression (2) based on a variation (DAHR) which is based on the movable range ( $\Delta$ AHR), and the battery ECU (68) sets (adopts) the new SOC (N-SOC) value if the movable range ( $\Delta$ AHR) is at least a predetermined actual movable range (Page 5, Para [0022]-[0025], Page 17, Para [0071]-[0075] and Figs. 11A-11F).

As per claims 38-39, the method and the program merely recites the steps of using the elements of the device as disclosed above and since each element must be present to perform the steps, the method as claimed would be inherent in view of the device as disclosed by Kikuchi.

As per claims 24 and 32, Kikuchi discloses that the ECU (68) sets (adopts) the lower limit value of the battery block (74) with the least charged amount (minimum remaining capacity of the unit batteries), as an integrated SOC or charged amount (RAHR) for controlling the battery assembly (50), if the movable range ( $\Delta$ AHR) is less than a pre-stored predetermined range (the range between 1.3AH and 5.2AH) (Page 9, Para [0062]-[0065]).

As per claims 25 and 33, Kikuchi teaches that the movable range ( $\Delta$ AHR) is affected by a variation (DAHR) in the charged amount, therefore it would be implicit that in the absence of a variation (DAHR), the movable range ( $\Delta$ AHR) would be at least a pre-stored predetermined maximum value (5.2AH-1.3AH), and the predetermined maximum value (5.2AH-1.3AH) would be considered by the ECU (68) (Page 9, Para [0062]-[0065] and Figs. 10A and 11A).

***Allowable Subject Matter***

7. Claims 26-29 and 34-37 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter:



As per claims 26 and 34 primarily, the prior art of record, taken alone or in combination thereof, does not disclose or suggest in the claimed combination:

the correlation being expressed by the following mathematical Expression:

$$SOC = (SOC_{mid} - SOC_{low}) / (Q_{high} - Q_{low} - Q_d) \times (Q_{min} - Q_{low}) + SOC_{low}$$

where SOC is the apparent state-of-charge value, and SOC<sub>mid</sub> is a control center value of the state-of-charge value, and SOC<sub>low</sub> is a lower limit set value of the state-of-charge value, and SOChigh is an upper limit set value of the state-of-charge value, and Q<sub>low</sub> is a capacity value converted from SOC<sub>low</sub>, and Q<sub>high</sub> is a capacity value converted from SOChigh, and Q<sub>d</sub> is the capacity difference, and Q<sub>min</sub> is the minimum remaining capacity.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ramy Ramadan whose telephone number is (571) 272-9761. The examiner can normally be reached on Mon-Fri 7:30 am-5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

Application/Control Number:  
10/563,462  
Art Unit: 2838

Page 9

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ramy Ramadan  
Examiner  
Art Unit 2838

RR



**BAO Q. VU**  
**PRIMARY EXAMINER**